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Real Party in Interest

The present application has been assigned to Applied Materials, Inc., 3050 Bowers Avenue, Santa Clara, California 95054.

Related Appeals and Interferences

Applicant previously appealed the final rejection of claims 21-24 and 26-28 in the present application in Office Action dated July 14, 2006 before the Board of Patent Appeals and Interferences (hereafter Board). The Board reversed the Examiner's rejection of claims 21-24 and 26-28 in a decision dated March 28, 2008 (*Ex Parte* Guan-Shian Chen and Michael X. Yang, Appeal 2008-0831, Application 10/770,737).

Status of Claims

Claims 26-28 are pending in the application. Claims 21-24 and 26-28 stand finally rejected in Office Action dated January 8, 2009. Claims 21-24 are subsequently cancelled and rejections of claims 26-28 are appealed. The pending claims are shown in the attached Claims Appendix.

Status of Amendments

Applicant filed one Response to Final Office Action dated January 8, 2009 on March 9, 2009. Applicant proposed to cancel claims 21-24 and to rewrite claims 26-28 in independent form in the Response filed on March 9, 2009. Applicant's proposed amendment to the claims was entered by the Examiner in Advisory Action dated March 23, 2009.

Summary of Claimed Subject Matter

Claimed embodiments of the invention are directed to a modular processing system (paragraph [0014] lines 1-2 of publication 2004/ 0154535).

In the embodiments of independent claim 26, an electroless processing system 100 (paragraph [0015] lines 1-2, paragraph [0017] line 20, and FIG. 1)) is provided. The electroless processing system 100 comprises a factory interface 101 (paragraph [0015] lines 2-4 and FIG. 1) having a substrate transfer robot 104 (paragraph [0015] lines 8-10) positioned therein, the factory interface 101 being configured to communicate with at least one substrate containing cassette 103 (paragraph [0015] lines 4-8), and at least two substrate processing modules 102 (paragraph [0015] lines 2-4 and FIG. 1) in detachable communication with the factory interface 101 (paragraph [0027] lines 1-6). Each of the at least two substrate processing modules 102 includes a pretreatment/post treatment cell 201 (paragraph [0017] lines 12-15, and FIG. 2) and an electroless processing cell 202 (paragraph [0014] lines 9-15, paragraph [0017] lines 2-6 and 16-21, and FIG. 2). The at least two substrate processing modules 102 are interchangeable (paragraph [0029] lines 1-3, and FIG. 1).

In the embodiments of independent claim 27, an electroless processing system 100 (paragraph [0015] lines 1-2, paragraph [0017] line 20, and FIG. 1)) is provided. The electroless processing system 100 comprises a factory interface 101 (paragraph [0015] lines 2-4 and FIG. 1) having a substrate transfer robot 104 (paragraph [0015] lines 8-10) positioned therein, the factory interface 101 being configured to communicate with at least one substrate containing cassette 103 (paragraph [0015] lines 4-8), and at least two substrate processing modules 102 (paragraph [0015] lines 2-4 and FIG. 1) in detachable communication with the factory interface 101 (paragraph [0027] lines 1-6). Each of the at least two substrate processing modules 102 includes a pretreatment/post treatment cell 201 (paragraph [0017] lines 12-15, and FIG. 2) and an electroless processing cell 202 (paragraph [0014] lines 9-15, paragraph [0017] lines 2-6 and 16-21,

and FIG. 2). The pretreatment/post treatment cells 201 are interchangeable within the processing system (paragraph [0019] lines 17-21, and lines 32-38, and FIG. 1).

In the embodiments of independent claim 28, an electroless processing system 100 (paragraph [0015] lines 1-2, paragraph [0017] line 20, and FIG. 1)) is provided. The electroless processing system 100 comprises a factory interface 101 (paragraph [0015] lines 2-4 and FIG. 1) having a substrate transfer robot 104 (paragraph [0015] lines 8-10) positioned therein, the factory interface 101 being configured to communicate with at least one substrate containing cassette 103 (paragraph [0015] lines 4-8), and at least two substrate processing modules 102 (paragraph [0015] lines 2-4 and FIG. 1) in detachable communication with the factory interface 101 (paragraph [0027] lines 1-6). Each of the at least two substrate processing modules 102 includes a pretreatment/post treatment cell 201 (paragraph [0017] lines 12-15, and FIG. 2) and an electroless processing cell 202 (paragraph [0014] lines 9-15, paragraph [0017] lines 2-6 and 16-21, and FIG. 2). The electroless processing cells 202 are interchangeable within the processing system (paragraph [0019] lines 25-29, and FIG. 1).

Grounds of Rejection to be Reviewed on Appeal

1. Claims 26-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hongo et al.* (U.S. Patent No. 6,921,466, hereafter *Hongo'466*) in view of *Hongo et al.* (U.S. Patent No. 6,716,330, hereafter *Hongo'330*).

2. Claims 26-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hongo'466* in view of *Dordi et al.* (U.S. Patent No. 6,267,853, hereafter *Dordi*).

ARGUMENTS

1. THE EXAMINER ERRED IN REJECTING CLAIMS 26-28 UNDER 35 U.S.C. § 103(a) AS BEING UNPATENTABLE OVER *Hongo'466* IN VIEW OF *Hongo'330* BECAUSE THE COMBINATION OF *Hongo'466* AND *Hongo'330* DOES NOT TEACH OR SUGGEST AT LEAST TWO SUBSTRATE PROCESSING MODULES IN DETACHABLE COMMUNICATION WITH A FACTORY INTERFACE, AND THE AT LEAST TWO SUBSTRATE PROCESSING MODULES ARE INTERCHANGEABLE, TWO PRETREATMENT/POST TREATMENT CELLS ARE INTERCHANGEABLE, OR TWO ELECTROLESS PROCESSING CELLS ARE INTERCHANGEABLE AS SET FORTH IN CLAIMS 26-28.

Claims 26-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hongo'466* in view of *Hongo'330*. Applicant respectfully traverses this rejection.

Hongo'466 teaches substrate processing systems for plating metal and removing plated metal (Column 1, lines 9-17). The Examiner asserts that *Hongo'466* teaches a system having two processing modules in Figure 47 except that *Hongo'466* fails to teach a module including an electroless plating cell and a pretreatment/post treatment cell. The Examiner further asserts that it is obvious to combine an electroless plating cell of *Hongo'330* with the systems of Figure 47 of *Hongo'466* to render claimed subject matter.

However, Applicant respectfully submits that the combination of *Hongo'466* and *Hongo'330* does not teach or suggest subject matter in claims 26-28. Particularly, the combination of *Hongo'466* and *Hongo'330* does not teach or suggest at least two substrate processing modules in detachable communication with a factory interface, and the at least two substrate processing modules are interchangeable, as set forth in claim 26.

The Examiner asserts that *Hongo'466* teaches a system having processing modules that are interchangeable. Applicant respectfully submits that the two processing modules 512 in the cited Figure 47 are not interchangeable as the two modules 512 have mirror image shapes (Figure 47 of *Hongo'466*). The module 512 on the left side cannot fit in the position of the module 512 on the right side, and vice versa.

Even though, *Hongo'466* uses the term "interchangeable" numerals times, for example, the term "interchangeable" is used to describe measuring units in Figure 31 (column 34 lines 7-11), measuring unit in Figure 42 (column 44 lines 24-26), the term "interchangeable" is not associated with the cited Figure 47. Therefore, the two modules are not interchangeable even if each module could be replaced by similar modules having different functions. Additionally, *Hongo'466* also does not teach or suggest that the two pretreatment/post treatment cells are interchangeable within the processing system, as set forth in claim 27. *Hongo'466* also does not teach or suggest that the two electroless processing cells are interchangeable within the processing system as set forth in claim 28.

Hongo'330 teaches an electroless plating apparatus 62 and using the electroless plating apparatus 62 as a standalone apparatus with in a system (Figure 4). *Hongo'330* does not teach or suggest a system having two or more processing module each comprising an electroless processing cell and a pretreatment/post treatment cell, as set forth in the pending claims.

Therefore, the combination of *Hongo'466* and *Hongo'330* does not teach or suggest an electroless processing system, comprising a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette, and at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the at least two substrate processing modules are interchangeable, as recited in claim 26.

The combination of *Hongo'466* and *Hongo'330* also does not teach or suggest an electroless processing system, comprising a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette, and at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the pretreatment/post treatment cells are interchangeable within the processing system, as recited in claim 27.

The combination of *Hongo'466* and *Hongo'330* also does not teach or suggest an electroless processing system comprising a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette, and at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the electroless processing cells are interchangeable within the processing system, as recited in claim 28.

Accordingly, claims 26-28 are in condition for allowance. Withdrawal of this rejection is respectfully requested.

2. THE EXAMINER ERRED IN REJECTING CLAIMS 26-28 UNDER 35 U.S.C. § 103(a) AS BEING UNPATENTABLE OVER *Hongo'466* IN VIEW OF *Dordi* BECAUSE THE COMBINATION OF *Hongo'466* AND *Dordi* DOES NOT TEACH OR SUGGEST AT LEAST TWO SUBSTRATE PROCESSING MODULES IN DETACHABLE COMMUNICATION WITH A FACTORY INTERFACE, AND THE AT LEAST TWO SUBSTRATE PROCESSING MODULES ARE INTERCHANGEABLE, TWO PRETREATMENT/POST TREATMENT CELLS ARE INTERCHANGEABLE, OR TWO ELECTROLESS PROCESSING CELLS ARE INTERCHANGEABLE AS SET FORTH IN CLAIMS 26-28.

Claims 26-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hongo'466* in view of *Dordi*. Applicant respectfully traverses the rejection.

The Examiner asserts that the combination of Figure 31 of *Hongo'466* and *Dordi* teaches a substrate processing module including a pretreatment/post treatment cell and an electroless processing cell. Applicant respectfully disagrees.

Figure 31 of *Hongo'466* teaches a system having a plurality of standalone processing units 111-118 and a forming unit 111 may be an electroless Ru plating unit (column 34 lines 29-40). However, *Hongo'466* does not teach or suggest the forming unit 111 is included in a module in detachable communication with a factory interface. *Dordi* teaches an electroless deposition cell rinse and spin dry a substrate by positioning the substrate at different elevation (Figure 17, column 13 line 25-column 14 line 23). However, the combination of *Hongo'466* and *Dordi* does not teach or suggest a processing module including a pretreatment/post treatment cell and an electroless processing cell as set forth the pending claims.

Therefore, the combination of *Hongo'466* and *Dordi* does not teach or suggest an electroless processing system, comprising a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette, and at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the at least two substrate processing modules are interchangeable, as recited in claim 26.

The combination of *Hongo'466* and *Dordi* also does not teach or suggest an electroless processing system, comprising a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette, and at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the pretreatment/post treatment cells are interchangeable within the processing system, as recited in claim 27.

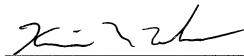
The combination of *Hongo'466* and *Dordi* also does not teach or suggest an electroless processing system comprising a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette, and at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the electroless processing cells are interchangeable within the processing system, as recited in claim 28.

Accordingly, claims 26-28 are in condition for allowance. Withdrawal of this rejection is respectfully requested.

CONCLUSION

For the reasons presented above, Applicant respectfully submits that the rejections over claims 26-28 are improper. Reversal of the rejections is respectfully requested.

Respectfully submitted,



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CLAIMS APPENDIX

1-25. (Canceled)

26. (Previously Presented) An electroless processing system, comprising:
a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette; and

at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the at least two substrate processing modules are interchangeable.

27. (Previously Presented) An electroless processing system, comprising:
a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette; and

at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the pretreatment/post treatment cells are interchangeable within the processing system.

28. (Previously Presented) An electroless processing system, comprising:
a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette; and

at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the electroless processing cells are interchangeable within the processing system.

29-31. (Canceled)

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

Ex Parte Guan-Shian Chen and Michael X. Yang, Appeal 2008-0831, Application 10/770,737, dated March 26, 2008.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GUAN-SHIAN CHEN
and MICHAEL X. YANG

Appeal 2008-0831
Application 10/770,737
Technology Center 1700

Decided: March 26, 2008

Before CHARLES F. WARREN, CATHERINE Q. TIMM, and
JEFFREY T. SMITH, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 1 through 3, 5, 6, 9, and 21 through 28 in the Office Action mailed July 14, 2006. Claims 1 through 3, 5, 6, 9, and 25 were subsequently cancelled in the Amendment filed October 16, 2006 entered in the Office Action mailed October 27, 2006, leaving claims

21 through 24 and 26 through 28 on appeal. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2006).

We reverse the decision of the Primary Examiner.

Claim 21 illustrates Appellants' invention of an electroless processing system, and is representative of the claims on appeal:

21. An electroless processing system, comprising:

a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette; and

at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell.

The Examiner relies upon the evidence in these references (Ans. 2):

Verhaverbeke	US 2003/0045098 A1	Mar. 6, 2003
Hongo	US 6,921,466 B2	Jul. 26, 2005

Appellants request review of the following grounds of rejection advanced on appeal (App. Br. 8):

claims 21, 23, 24, and 26 through 28 under 35 U.S.C. § 102(e) as unpatentable over Hongo (Ans. 3); and

claim 22 under 35 U.S.C. § 103(a) as unpatentable over Hongo in view of Verhaverbeke (Ans. 4).

Appellants argue the claims in the first ground of rejection as a group. App. Br. 10-11. Thus, we decide this appeal based on claims 21 and 22. 37 C.F.R. § 41.37(c)(1)(vii) (2006).

The basic issues in this appeal are whether the Examiner has carried the burden of establishing a prima facie case in each of the grounds of rejection advanced on appeal.

These issues turn on the threshold issue of the interpretation of the plain language of the second clause of claim 21. The terms used in this clause are given their broadest reasonable interpretation in their ordinary usage in the context of the claim as a whole as they would be understood by one of ordinary skill in the art, in light of the written description in the Specification, including the drawings, without reading into the claim any disclosed limitation or particular embodiment. *See, e.g., In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000); *In re Morris*, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989).

We agree with Appellants (App. Br. 10-11; Reply Br. 2) that a reasonable interpretation of the terms of the second clause of claim 1 in light of the Specification is that each of the detachable processing modules must have at least the specified two different cells or units. Spec., e.g., ¶¶ 0006-0009, 0014, 0017, and 0026, and Figs. 1 and 2. Thus, contrary to the Examiner's position, claim 21, and claims dependent thereon, cannot be interpreted as "open to a single cell which is capable of providing electroless plating and pretreatment/post treatment of the substrate." Ans. 4.

In view of our interpretation of claim 21, we cannot sustain the Examiner's position with respect to the ground of rejection under § 102(e) over Hongo. Ans. 3-4 and 4-5. In order to establish a prima facie case of anticipation under this statutory provision, the Examiner must show that, as a matter of fact, Hongo describes to one skilled in this an electroless processing system that meets each and every limitation of claim 21,

arranged as required therein. *See, e.g., In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997), and cases cited therein.

Thus, even though Appellants (App. Br. 11) do not dispute the Examiner's determination that detachable units 111 and 112 of Hongo's semiconductor processing apparatus¹ are each capable of performing both "pretreatment/post treatment" and "electroless processing" steps (Ans., e.g., 4-5), such teachings do not describe the claimed system within the meaning of § 102(e) as Appellants contend. App. Br. 10-11; Reply Br. 2. Indeed, the Examiner's contentions with respect to the claimed system encompassed by claim 21 vis-à-vis the teachings of Hongo are more akin to a determination of obviousness under § 103(a).

Accordingly, in the absence of a prima facie case of anticipation, we reverse the ground of rejection under 35 U.S.C. § 102(e).

The Examiner relies on the same claim construction and teachings of Hongo in combination with the teachings of Verhaverbeke to reject dependent claim 22 under § 103(a). Ans. 4. Appellants contend the Examiner's position in applying Hongo to independent claim 21 does not establish that Hongo would have taught the elements required by claim 21, and thus, claim 22, to one of ordinary skill in this art. App. Br. 13. We agree with Appellants that the Examiner has not addressed the issue of whether Hongo alone would have rendered claim 21 prima facie obvious to one of ordinary skill in this art within the meaning of § 103(a), and the further combination of Verhaverbeke with Hongo also does not address the same claim limitations with respect to claim 22. Indeed, the Examiner has

¹ *See Hongo*, e.g., col. 33, l. 59 to col. 50, l. 20, and Figs. 31, 36, and 45.

not established that one of ordinary skill in this art armed with the knowledge in the art would have separated the functions performed by a single unit of Hongo's system as illustrated in, for example, Fig. 31 thereof, into two different processing sections on that same unit. *See, e.g., B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582 (Fed. Cir. 1996) ("When obviousness is based on a particular prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference. This suggestion or motivation need not be expressly stated." (citation omitted)).

Accordingly, in the absence of a prima facie case of obviousness, we reverse the ground of rejection under 35 U.S.C. § 103(a).

The Primary Examiner's decision is reversed.

REVERSED

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